

SEXUAL DIMORPHISM IN *LYSIOSQUILLA SCABRICAUDA*
(LAMARCK) A STOMATOPOD CRUSTACEAN¹

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INTRODUCTION

Sexual dimorphism in the stomatopoda has been reported by several authors. Various species in at least four genera, *Gonodactylus*, *Lysiosquilla*, *Pseudosquilla*, and *Squilla*, are known to show sexual variation. Among the western Atlantic species of stomatopods, *Squilla intermedia* Bigelow exhibits the most evident sexual differentiation (Bigelow, 1894). In this species, the margin of the telson in the adult male is noticeably thickened. Bigelow (1941) also showed differences in the sculpture of the telson and the lateral abdominal carinae of male and female *S. empusa* Say.

In the genus *Lysiosquilla*, sexual dimorphism affects, among other structures, the size of the raptorial claw and the number of teeth on its dactylus. In *L. glabriuscula* (Lamarck), the size and number of teeth on the raptorial dactylus of the female are reduced (Bigelow, *loc. cit.*). Holthuis (1941) listed four secondary sexual characteristics exhibited by large females of *L. maculata* (Fabricius), the Pacific analogue of *L. scabricauda*. They are:

1. The propodus of the raptorial claw is three times longer than broad, while in young females and males it is about four times longer than broad.
2. Only the two proximal movable spines on the inner border of the raptorial propodus are well developed in large females. In young females and males the normal number of four spines is present.
3. There are tufts of long hairs on the raptorial propodus which are not present in males and young females.
4. The teeth of the raptorial claw are very much reduced in large females.

Marked sexual dimorphism has not been reported for *L. scabri-*

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cauda. Miers (1880) reported no sexual differences. Bigelow (*loc. cit.*) noted that the raptorial dactyli in females were a little smaller than in males, and Lunz (1937) and Schmitt (1940) gave further observations on the size of the female raptorial claw. Lunz also stated that the telson of the female was more convex than that of the male.

Recently I examined 13 large specimens of *L. scabricauda* from south Florida, on which the sexual differences listed above as well as others were observed. Differences were found not only in size of the raptorial claw in each sex, but also in the spination of the fifth and sixth abdominal somites, uropods, and telson, and in the relative scabrousness of the telson. These differences are described and systematic notes on the species are included.

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CHML refers to specimens in the Cape Haze Marine Laboratory collection, and the remaining specimens are in the collections of The Marine Laboratory (UMML).

MATERIAL EXAMINED

Males: UMML 32.1164 (158 mm.); Fort Pierce, north bridge, grass flats; 7-18-56: UMML 32.1161 (275 mm.); Miami, Pier No. 1: UMML 32.164 (210 mm.); Miami Beach, Biscayne Bay; 5-10-46: UMML 32.1202 (210 mm.); Biscayne Bay, Dinner Key Yacht Basin; 5-19-59: UMML 32.1160 (210 mm.); Key West; 7-27-7-31: UMML 32.854 (245 mm.); Key West, 30 mi. NW; 3-22-51: UMML 32.1173 (235 mm.); Key West; 11-7-58: CHML (235 mm.); Lemon Bay; Summer, 1953.

Females: UMML 32.1163 (127 mm.); Indian River (in push net); 10-15-57: UMML 32.1166 (192 mm.); Biscayne Bay, North Bay Island; 10-5-48: UMML 32.1167 (220 mm.); Key West, near the aquarium; 2-48: CHML (235 mm.); Placida, R.R. trestle; 12-3-57: CHML (200 mm.); Gasparilla Sound; 5-11-55.

SEXUAL DIMORPHISM

The raptorial claw in both sexes is well-developed, and is armed with 8 to 12 strong teeth on the inner margin of the dactylus. In the male, the raptorial claw, when folded, extends from a point anterior to the eyes to the posterolateral angles of the carapace. The raptorial claw of the female, when folded, extends from a point anterior to the eyes to the region of the cervical groove. The relation of the length of the raptorial propodus to carapace length (carapace length/propodus length) is expressed as the Propodal Index (Table 1).

TABLE 1.

RELATION OF SIZE OF RAPTORIAL PROPODUS TO CARAPACE LENGTH IN *LYSIOSQUILLA SCABRICAUDA*

Males		Females	
Total Length in mm.	Propodal Index	Total Length in mm.	Propodal Index
275	0.72	235	0.90
245	0.60	220	0.96
235	0.59	200	1.05
235	0.68	192	0.77
210	0.73	127	0.72
210	0.62		
210	0.74		
158	0.70		

It can be seen from this table that in adult males the raptorial propodus is much larger than in females of a comparable size. In young females and young males the size of the raptorial propodi are virtually the same.

There was no reduction in size or number of teeth on the raptorial dactylus of any of the females examined.

Another sexual variation found in the raptorial claw is the presence of tufts of hair on the inner border of the propodus and on the dorsal ridge of the carpus. These tufts are much more pronounced in the female than in the male. Unlike *L. maculata*, all four movable teeth are present on the inner margin of the propodus of the female.

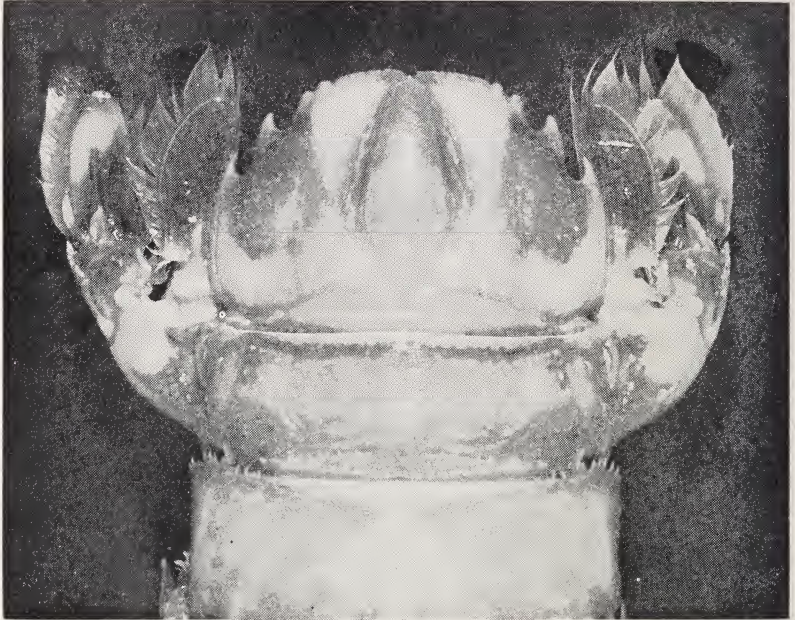


Figure 1. *L. scabricauda*, ♂. Dorsal view of posterior portion of body, x 3



Figure 2. *L. scabricauda*, ♀. Dorsal view of posterior portion of body, x 3

Figures 1 and 2 illustrate the posterior portion of the body of a male and female *L. scabricauda* in dorsal view.

The posterior border of the fifth abdominal somite is armed with a few short, sharp spines. These spines in male specimens are few in number and are interrupted along the median border of the somite. In the female the spines are more numerous, better developed, and may extend across the median portion of the somite.

The surface of the sixth abdominal somite is rough and scabrous in both sexes, but much rougher in the female. Both the anterior and posterior margins of this somite are armed with rows of small, sharp spinules. There are, on the anterior margin, two rows which converge laterally. These spinules are larger, more numerous, and placed closer together in the female.

Most of the dorsal surface of the telson in the male is rough and scabrous; however, there may be two lateral areas that are pitted rather than scabrous. In the female, the entire dorsal surface of the telson, with the exception of the smooth median elevation, is covered with prominent granules. The telson is wider than long in both sexes. The dorsal surface is convex, in the ventral concave. The telson is much thickened and more convex dorsally in the female, and, in the female, the posterior margin of the telson is convex. In the male it is almost transverse.

There are no true denticles on the posterior margin of the telson. There are usually four marginal spines and many fused marginal spinules on either side of the median line in the male. In the female, the marginal spinules are not fused, and there may be 7 to 11 of these spinules mesial to the submedian spine. The lateral spines of the female each have two or three spinules on their dorsal surface, and the marginal carinae are armed with a row of small, but prominent, spines. The marginal carinae of the male are smooth.

The spination of the uropod differs in each sex. On the basal segment of the uropod of the female there is a pronounced row of spinules which run parallel to the body. This row of spinules joins another row which outlines the articulation of the endopod. These rows of spinules are less prominent in the male. Also, in both sexes, there is a patch of spinules on the dorsal surface of the penultimate segment of the uropod. These spines number 6 to 8 in the female and 1 to 4 in the male. The endopod of the female bears on its

dorsal surface a longitudinal carina armed with a series of short spinules. These spinules are absent on male specimens.

Holthuis (1941) stated that the size range of 150-200 mm. was the transition zone between females exhibiting secondary sexual characteristics and young females and males. In *L. scabricauda* the differences in scabrousness in the telson are noticeable in females 135 mm. long, although neither the reduction in length of the raptorial claw nor the tufts of hair on the propodus are prominent at that size. The tufts of hair on the propodus of females are noticeable at 198 mm. It is probable that the transition zone is the same in *L. scabricauda* as in *L. maculata*.

REMARKS

L. scabricauda has been reported from New England (larval stage) to Brazil, including the Gulf of Mexico and the Caribbean; it has also been recorded from West Africa (Manning, 1959). The occurrence of this species in Brazil was first reported by Dana (1852) who described *L. inornata* from there. *L. inornata*, a synonym of *L. scabricauda*, was selected as the type of the genus by Fowler (1912). Dana's type of *L. inornata* is not extant, but a specimen collected by the U. S. Exploring Expedition to Brazil was found in the collections of the U. S. National Museum. The specimen, a male, USNM 2115, is here selected as the lectotype of *L. inornata*, and thus becomes the type of the genus *Lysiosquilla*.

The spination and roughness of the telson of this male from Brazil is better developed than in males of similar size from Florida.

As Schmitt (1940) and Holthuis (1941) pointed out, the *L. maculata* reported by Stebbing (1902) from Antigua, B.W.I., and the reference to the same species from the Florida Keys by Boone (1930) are misidentifications; both specimens are referable to *L. scabricauda*.

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